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F24C 3/04

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F4T TC T279

(56) Documents cited
GB 2215033 A GB 2185100 A GB 2179438 A
GB 2136949 A US 3947229 A

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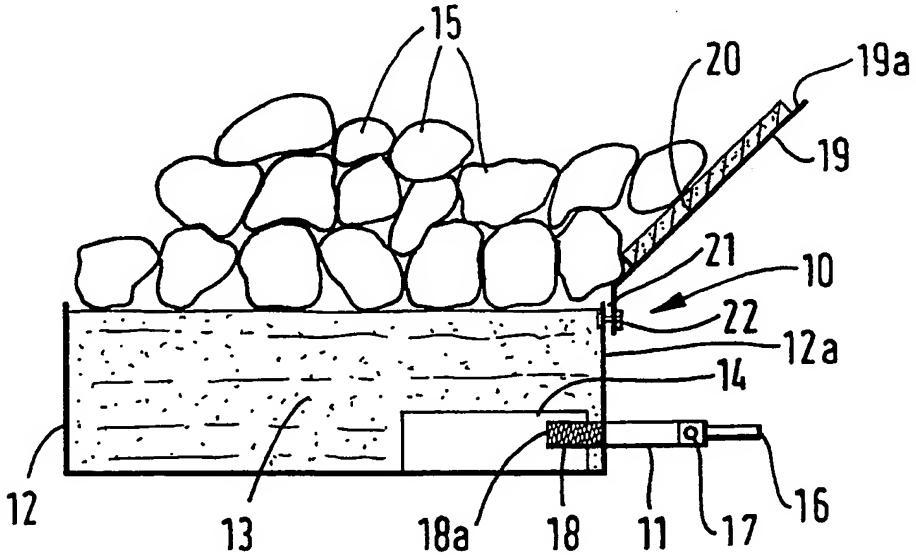
(54) Gas fire

(57) A coal-effect gas fire 10 comprises a vermiculite bed 13 supporting pieces of ceramic material 15 which simulate the appearance of coal. A pair of fuel gas/air inlet pipes 11 lead into the lower region of the bed. At its outlet end each of the inlet pipes 11 is extended by a gauze or porous ceramic tube 18 which may be telescopically extendable into the space under a respective one of distribution plates 14. The distal end of each tube 18 may be blanked off by a metal disc or the end may itself be formed of gauze. As the gas/air mixture passes out through the interstices of the tube 18, it becomes uniformly mixed before being distributed through slots/holes (not shown) in the distribution plates 14 or escaping around the peripheries of those plates. A variable size gap 21 for the ingress of secondary air above the bed 12 is defined between a fixed wall 12a and a slidable plate 19 at the back of the fire.

FIG. 1



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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

FIG. 1

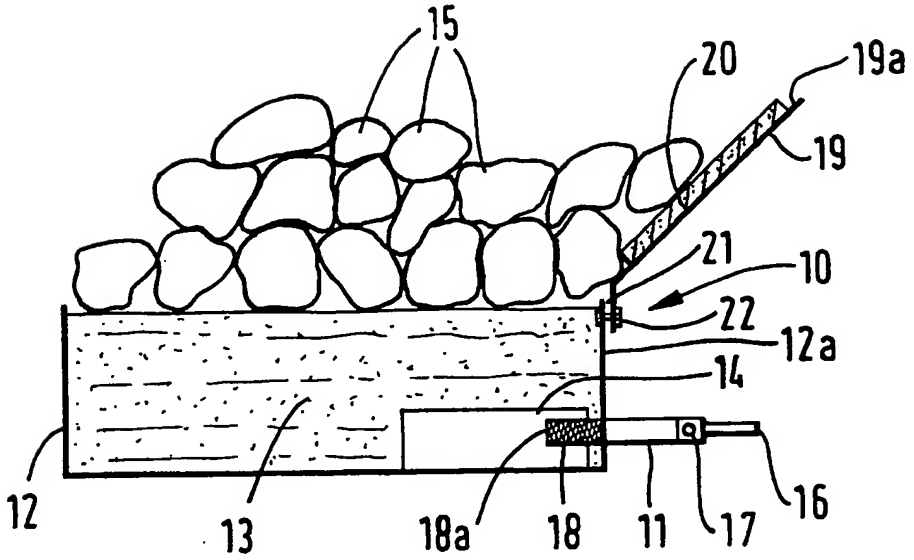
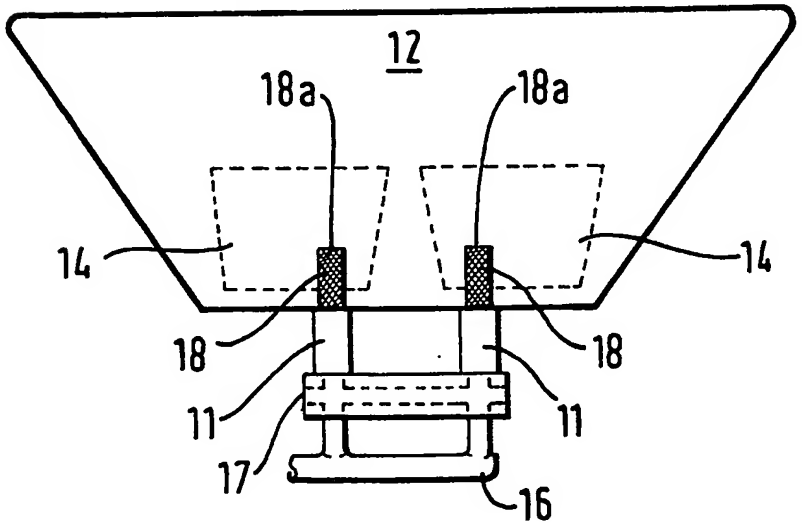

15
20
19a
19
21
10
22
12a
14
12
13
18a
18
11
17
16

FIG. 2


12
18a
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Improvements in or relating to gas fires

The present invention relates to a gas fire and is concerned particularly, although not exclusively, with a gas fire having the appearance of a solid fuel fire.

In recent years coal or log-effect gas fires have become increasingly popular because they combine the desirable appearance of a coal fire with the efficiency and ease of operation of a gas fire.

Typically such coal or log-effect gas fires comprise: a gas supply pipe; an air intake pipe, often in the form of a venturi pipe; a mixing chamber in which the gas and air are mixed, the chamber being at least partially filled with particles of ceramic material usually vermiculite, and larger pieces of ceramic elements which simulate pieces of coal.

The purpose of the vermiculite is to assist in the even distribution of the gas/air mixture from the mixing chamber and also to inhibit a phenomenon known as "burn-back". Burn-back occurs when the gas/air mixture begins to combust below the desired location for combustion (ie. in the region of the simulated coal) and can be dangerous as combustion can take place towards the bottom of the mixture chamber and even in and around the gas supply pipe. Often this phenomenon occurs when the vermiculite has become over-heated, possibly due to it becoming clogged, which over-heating can, at a sufficiently high temperature, lead to the spontaneous combustion of the gas/air mixture.

A suggested solution to this problem is the provision of a perforated plate or mesh in the upper region of the

mixing chamber which plate supports the vermiculite particles and then, above those particles, the pieces of simulated coal. The provision of the perforated or mesh plate inhibits burn-back to some extent. However, if the plate or mesh itself becomes very hot this can give rise to burn-back as it may cause the gas/air mixture below the plate to ignite.

Accordingly, the present invention aims to provide a gas fire in which the likelihood of burn-back is reduced.

According to a first aspect of the present invention there is provided a gas fire having a gas inlet, an air inlet, a mixing chamber, and a foraminous element arranged so that the gas and air pass through the porous element at or near their point of entry into the mixture chamber.

The foraminous element may comprise a porous ceramic element. Alternatively or additionally, the foraminous element may comprise a gauze element.

The foraminous element may be substantially cylindrical with pores in one or more surfaces (preferably the cylindrical surface) of the element. An end surface of the substantially cylindrical foraminous element may be non-porous. The foraminous element may comprise a portion of porous tube.

The foraminous element may be integral with or attached to a gas/air inlet or to a wall of the mixing chamber.

Preferably there are two foraminous elements, each integral with or connected to respective gas/air inlet or to a wall of the mixture chamber.

The gas fire may comprise a solid fuel effect gas fire.

According to a second aspect of the present invention there is provided a gas fire having a gas inlet, an air inlet and a mixing chamber, and a foraminous element at or near the point of entry of the gas and air into the mixture chamber arranged so that the gas and air pass through it, the surface area of the foraminous element being variable.

The foraminous element may comprise a gauze element. Alternatively or additionally the foraminous element may comprise a porous ceramic element.

The foraminous element may be slidably connected to a combined gas/air inlet and/or to a wall of the mixing chamber. The foraminous element may be telescopically extendable.

According to a third aspect of the present invention there is provided a gas fire comprising a gas inlet, an air inlet, a mixing chamber in which the gas and air is mixed and an upwardly extending rear plate arranged, so that in use, it is located at the rear of the gas fire, wherein there is a gap between a wall of the mixing chamber and the upwardly extending plate such that air may be drawn into an upper region of the mixing chamber through the gap.

Preferably the arrangement is such that the gap is variable in size.

In a preferred arrangement the gap may be closeable.

The upwardly extending plate may be slidable towards or away from the wall of the mixing chamber to reduce or increase the size of the gap respectively. Alternatively or additionally there may be one or more threaded connectors between the upwardly extending plate and the wall of the mixing chamber.

The features of the above mentioned aspects of the present invention may be combined.

Embodiments of the invention will now be described by way of example with reference to the accompanying diagrammatic drawings in which:

Figure 1 is a section through a gas fire according to an embodiment of the present invention; and

Figure 2 is a plan view of a mixing chamber of the gas fire.

Referring to the drawings, a coal-effect gas fire is shown generally at 10. The fire 10 comprises a mixing chamber 12 filled with vermiculite granules 13 and distribution plates 14 (the position of which is shown by broken lines in Figure 2). On top of the vermiculite granules are pieces of ceramic material 15 simulating coal.

A gas supply pipe 16 leads via branches 16a, 16b into a mixing tube having air inlets 17. A pair of gas/air inlet pipes 11 leads from the mixing tube into the lower region of the mixing chamber.

At its outlet end each of the inlet pipes 11 is extended by a gauze tube 18 which extends into the space

under a respective one of the distribution plates 14. The distal end of each tube 18 may be blanked off by a metal disc or the end may itself be formed of gauze.

In use, gas is supplied from the gas supply pipe 16 to the gas/air inlet pipes 11, air being drawn in through the air-intake holes 17. The gas/air mixture in each tube 11 passes through the respective gauze tube 18 as it enters the mixing chamber 12. As the gas/air mixture passes out through the interstices of the gauze tube 18, it becomes uniformly mixed before being distributed through slots/holes (not shown) in the distribution plates 14 or escaping around the peripheries of those plates. The mixture then percolates upwards through the vermiculite towards the pieces 15 of simulated coal whereupon, in use, it burns giving the appearance of a coal fire.

The gauze tubes 18 fulfil one or more of four purposes as will now be explained.

Firstly if, as can often happen, the vermiculite becomes partly clogged and over heats it is common for "burn-back" to take place, in which the gas and air mixture burns in the mixture chamber. This can be dangerous if the burning back takes place in the gas/air inlet pipe 5. The provision of the gauze tubes 18 inhibits burn-back taking place in the gas/air inlet pipes since flame cannot normally pass through the gauze.

Secondly, the air and gas become more evenly mixed as they escape from the gauze tube. This provides for more efficient combustion of the gas.

Thirdly, the gauze tubes have a silencing effect on the gas/air flow. Often with gas fires of this kind a hissing sound accompanies the burning of the gas/air mixture. The provision of the gauze tubes greatly reduces any noise produced in this manner.

A fourth advantage of the gauze tubes is that, by varying their length or by otherwise varying the surface area of the gauze the amount of air mixed with gas may be altered. A benefit of this is that the colour of the resultant flame may be adjusted to make it more appealing to the eye of a user of the fire. Additionally combustion efficiency can be altered by adjusting the length or surface area of the gauze tube to provide an optimum quantity of air in the gas/air mixture.

At the rear of the fire there is an upwardly extending inclined plate 19 which is connected to a rear wall 12a of the mixture chamber. A slab of ceramic material 20 is attached to the forwardly facing surface 19a of the plate 19 to reflect/radiate heat from the fire as the slab becomes hot. Between the plate 19 and the wall 12a of the mixture chamber 12 there is a narrow gap 21 which extends along the length of the plate 19 and wall 12a. In use, air is drawn through this gap to provide a secondary intake of air to the fire above the vermiculite bed.

The plate 19 is connected to the rear wall 12a of the mixture chamber 12 by means of screws 22 engaging in respective nuts welded on to the rear wall 12a of the mixing chamber. By varying the size of the gap 21 the amount of air drawn into the mixture chamber 12 via the secondary intake may be controlled, thereby enabling the colour of the flame and the efficiency of combustion to be

varied. The size of the gap 21 may be altered by tightening/loosening the screws 22. In an alternative embodiment (not shown) the plate 19 may be slidably mounted on the mixing chamber 12 to permit adjustment of the width of the gap 21.

Whilst the invention has been described with reference to a coal-effect gas fire it will be appreciated that it could equally be used with other forms of solid fuel effect gas fire such as a wooden log effect gas fire.

The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

CLAIMS

1. A gas fire having a gas inlet, and air inlet, a mixing chamber, and a foraminous element arranged so that the gas and air pass through the foraminous element at or near their point of entry into the mixing chamber.

2. A gas fire according to claim 1 wherein the foraminous element comprises a porous ceramic element.

3. A gas fire according to claim 1 or claim 2 wherein the foraminous element comprises a gauze element.

4. A gas fire according to any of the preceding claims wherein the foraminous element is substantially cylindrical with pores in one or more surfaces of the element.

5. A gas fire according to claim 4 wherein there are pores in the cylindrical surface of the element.

6. A gas fire according to claim 4 or claim 5 wherein an end surface of the substantially cylindrical foraminous element is non-porous.

7. A gas fire according to any of the preceding claims wherein the foraminous element comprises a portion of porous tube.

8. A gas fire according to any of the preceding claims wherein the foraminous element is integral with or attached to a gas/air inlet or to a wall of the mixing chamber.

9. A gas fire according to any of the preceding claims wherein there are two foraminous elements, each integral with or connected to a respective gas/air inlet or to a wall of the mixing chamber.

10. A gas fire according to any of the preceding claims wherein the gas fire comprises a solid fuel effect gas fire.

11. A gas fire having a gas inlet, an air inlet and a mixing chamber, and a foraminous element at or near the point of entry of the gas and air into the mixing chamber arranged so that the gas and air pass through it, the surface area of the foraminous element being variable.

12. A gas fire according to claim 11 wherein the foraminous element comprises a gauze element.

13. A gas fire according to claim 11 or claim 12 wherein the foraminous element comprises a porous ceramic element.

14. A gas fire according to any of claims 11 to 13 wherein the foraminous element is slidably connected to a combined gas/air inlet and/or to a wall of the mixing chamber.

15. A gas fire according to any of claims 11 to 14 wherein the foraminous element is telescopically extendable.

16. A gas fire comprising a gas inlet, an air inlet, a mixing chamber in which the gas and air is mixed and an upwardly extending rear plate arranged so that, in use, it is located at the rear of the gas fire, wherein there is a gap between a wall of the mixing chamber and the

upwardly extending plate such that air may be drawn into an upper region of the mixing chamber through the gap.

17. A gas fire according to claim 16 wherein the arrangement is such that the gap is variable in size.

18. A gas fire according to claim 16 or claim 17 wherein the arrangement is such that the gap is closeable.

19. A gas fire according to any of claims 16 to 18 wherein the upwardly extending plate is slidable towards or away from the wall of the mixing chamber to reduce or to increase the size of the gap respectively.

20. A gas fire according to any of claims 16 to 19 wherein there is one or more threaded connectors between the upwardly extending plate and the wall of the mixing chamber.

21. A gas fire substantially as herein described with reference to the accompanying drawings.

Patents Act 1977
Examiner's report to the Comptroller under Section 17 (The Search Report)

Application number

9117255.1

Relevant Technical fields

(i) UK Cl (Edition K) F4T (TC)

(ii) Int Cl (Edition 5) F24C

Search Examiner

M J DAVEY

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

28 JULY 1992

Documents considered relevant following a search in respect of claims 1 TO 15

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	2215033 A (DUNSLEY) See pad 40 in figure 1	1,2,9,10
X	2185100 A (WRIGHT) See plaque 20 in figure 1	1,2,10
X	2179438 A (FLAMELOG) See mesh 10 of figure 1	1,3,8,10
X	2136949 A (MITCHELL) See plate 3 in the figure	1,2,10
X	US 3947229 (RICHTER) See refractory plate 6	1,2,8,10

Category	Identity of document and relevant passages	Rele .t to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

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